

### REMARKS

Claims 1-20 are pending in the application. Claim 20 has been cancelled. Claims 2, 10, 13, and 17-19 have been withdrawn from consideration. Please add new Claims 21 and 22. Please amend Claims 1 and 9. Applicant respectfully requests entry of the foregoing amendments to Claims 1 and 9 and new Claims 21 and 22 prior to further examination. No new matter has been added.

#### Regarding Withdrawn and Cancelled Claims

Claims 2, 10, 13, and 17-19 have been withdrawn from consideration. Applicant respectfully requests that Claims 2, 10, and 13 be rejoined upon allowance of the application because Claims 2, 10, and 13 depend from allowable Claims 1 and 9. (*See* M.P.E.P § 821.04). Further, Applicant respectfully requests that Claims 17-19 be rejoined upon allowance of the application because Claims 17-19 require all the limitations of allowable product Claims 1 and 9. (*See* M.P.E.P § 821.04(b)).

Claim 20 has been herein cancelled. Applicant does not acquiesce to the rejection of Claim 20 and reserves the right to file a continuing application or take such other appropriate action as deemed necessary to protect the subject matter of the canceled claims. Applicant does not hereby abandon or waive any rights in the subject matter of the canceled claims.

#### Regarding Section 103 rejections

Claims 1, 3-9, 11, 12 and 14-16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Barrett (U.S. Patent No. 5,737,203) in view of Kober (U.S. Patent No. 3,212,039). Applicant respectfully traverses the rejection.

With respect to Claim 1, the present invention features a control winding element including a control conductor wound in a turn-by-turn figure-eight configuration having a first winding and a second winding around respective outer legs, the winding configuration canceling turn-by-turn induced voltages in the first and second windings allowing the variable inductor to operate in a high magnetic flux region, wherein a current through the control winding element causes a change in inductance of the main winding element. The advantage of the figure-eight

design over prior art configurations is in the turn-by-turn cancellation of the induced voltage in the control coil allowing the variable inductor to operate in a higher magnetic flux region than prior art designs. In contrast, prior art designs cancel the induced voltage over the entire length of the coil, but allow the buildup of voltage between ground and each turn (turn-by-turn) of the control coil thereby preventing the inductor to operate in a higher magnetic flux region. (*See* Specification, page 3, lines 17-27 and page 7, lines 1-13).

Barrett does not teach or suggest a control conductor wound in a figure-eight configuration. Rather, Barrett describes a transformer 40 including an E-shaped core 42 having a center leg 48 positioned between a first leg 44 and a second leg 46. The center leg 48 includes a primary winding 50 and a secondary winding 52. The first leg 44 includes a first DC control winding 54 and the second leg 46 includes a second but oppositely wound DC control winding 56. The DC control coils 54, 56 are joined in series to cancel out, as a whole, the induced voltage in the combined DC control coil 54, 56. Barrett's design allows for the buildup of voltage between ground and each turn (turn-by-turn) of the DC control coil. Thus, the transformer of Barrett would breakdown if operated in high magnetic flux regions due to the turn-by-turn induced voltage in each winding of the DC control coil. (*See* Barrett, Col. 8, line 50 – 9, line 67; and Figs. 3A and 3B).

Kober does not teach or suggest a control conductor wound in a figure-eight configuration. Rather, Kober describes a variable voltage transformer (e.g. Fig 3); including an E-shaped core 1 having a center primary leg 2 and two outer secondary legs 3, 4. The primary leg 2 includes a primary winding 12 (the primary winding is not a control winding) having three potential wrapping configurations (one figure-eight configuration) to allow for uniform flux density in the primary leg 2 and not for canceling of turn-by-turn induced voltages in the primary leg 2. Each of the secondary legs 3, 4 include a separate but oppositely wound secondary winding (control windings) 15, 16. Similar to Barrett and other prior art designs, the secondary windings (control windings) 15, 16 are joined in series to cancel out, as a whole, the induced voltage in the combined secondary winding (control windings) 15, 16. Kober's design allows for the buildup of voltage between ground and each turn (turn-by-turn) of the secondary winding (control windings) 15, 16. Thus, the variable voltage transformer of Kober would breakdown if

operated in high magnetic flux regions due to the turn-by-turn induced voltage in each winding of the secondary winding. (*See* Kober, Col. 2, line 58- Col. 5, line 40; and Figs. 3-6).

Neither Barrett or Kober, alone or in combination teach, suggests, or makes obvious “a control winding element comprising a control conductor wound in a turn-by-turn figure-eight configuration having a first winding and a second winding around respective outer legs, the winding configuration canceling turn-by-turn induced voltages in the first and second windings, wherein a current through the control winding element causes a change in inductance of the main winding element” as claimed in Claim 1 because neither Barrett or Kober look to solve the problem of canceling the turn-by-turn control coil induced voltage. As such, one would not look to combine Barrett and Kober because the control coils of each reference exhibit a buildup of voltage between ground and each turn (turn-by-turn) of the control coil. Thus, a variable inductor produced by the combination of Barrett and Kober would experience an electrical breakdown of the insulation in the control windings when operating in high magnetic flux regions. Further, the turn-by-turn cancellation of the induced voltage in the control coil allows for operation in high magnetic flux density ranges as claimed in new dependent Claim 21. Therefore, at the very least the combination of Claim 1 and new Claim 21 is allowable. Claim 9 and new Claim 22 includes similar limitations. Therefore, Applicant respectfully requests the withdrawal of the rejection of Claims 1 and 9 under 35 U.S.C. §103.

Claims 3-8, and 11, 12, 14-16 are dependent on allowable base claims 1 and 9, respectively, and are allowable for the same reasons. Applicant respectfully requests the withdrawal of the rejection of Claims 3-8, and 11, 12, 14-16 under 35 U.S.C. § 103.


**CONCLUSION**

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

Dated: January 9, 2007

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